

IN THE CLAIMS

Please delete claims 25-56 and 61-64.

Please add the following new claims:

65. A method of manufacturing an interconnect comprising:
a) depositing and patterning a first conductive layer;
b) depositing a first insulative layer over the first patterned conductive layer;
c) opening an air gap in the first insulative layer; and
d) depositing a sealing layer over the first insulative layer and the air gap to seal the air gap.

66. The method of Claim 65 wherein the step of opening an air gap in the first insulative layer includes the steps of:

a) applying a photoresist material to the first insulative layer, said photoresist material defining an air gap pattern; and
b) etching the air gap in the first insulative layer based on the air gap pattern.

67. The method of Claim 65 further comprising:

opening a via hole in the sealing layer and first insulative layer.

68. The method of Claim 67 wherein the step of opening a via hole in the sealing layer and the first insulative layer includes the steps of:

a) applying a photoresist material to the sealing layer, said photoresist material defining a via hole pattern; and
b) etching a via hole in the sealing layer and first insulative layer based on the via hole pattern.

69. The method of Claim 67 further comprising the steps of:
forming a conductive plug in the via hole;
depositing a second conductive layer over the sealing layer; and
 patterning the second conductive layer.

70. The method of Claim 67 further comprising the steps of:
simultaneously forming a conductive plug in the via hole and depositing a second
conductive layer over the sealing layer; and
 patterning the second conductive layer

71. The method of Claim 65 further comprising the steps of:
depositing a second insulative layer over the sealing layer; and
 forming a via hole through the second insulative layer, the sealing layer, and the first
insulative layer.

72. The method of Claim 71 further comprising the steps of:
forming a conductive plug in the via hole;
depositing a second conductive layer over the sealing layer; and
 patterning the second conductive layer.

73. The method of Claim 71 further comprising the steps of:
simultaneously forming a conductive plug in the via hole and depositing a second
conductive layer over the sealing layer; and
 patterning the second conductive layer.

~~74.~~ The method of Claim 65 further comprising the steps of:
depositing a second insulative layer over the sealing layer;
depositing a hard mask over the second insulative layer; and
forming a via hole through the hard mask, the second insulative layer, the sealing layer,
and the first insulative layer.

~~75.~~ The method of Claim 74 further comprising the steps of:
forming a conductive plug in the via hole;
depositing a second conductive layer over the sealing layer; and
 patterning the second conductive layer.

~~76.~~ The method of Claim 74 further comprising the steps of:
simultaneously forming a conductive plug in the via hole and depositing a second
conductive layer over the sealing layer; and
 patterning the second conductive layer.

~~77.~~ A method of manufacturing an interconnect comprising:
a) depositing and patterning a first conductive layer;
b) depositing a first insulative layer over the first patterned conductive layer;
c) depositing a first hard mask on the first insulative layer;
d) opening an air gap in the first hard mask and the first insulative layer; and
e) depositing a sealing layer over the first hard mask and the air gap to seal the air gap.

~~78.~~ The method of Claim 77 wherein the step of opening an air gap in the first hard
mask and the first insulative layer includes the steps of:
a) applying a photoresist material to the first hard mask, said photoresist material defining
an air gap pattern; and
b) etching the air gap in the first hard mask and the first insulative layer based on the air
gap pattern.

89. The method of Claim 77 further comprising:
opening a via hole in the sealing layer, the first hard mask, and first insulative layer.

80. The method of Claim 79 wherein the step of opening a via hole in the sealing layer, the first hard mask, and the first insulative layer includes the steps of:
a) applying a photoresist material to the sealing layer, said photoresist material defining a via hole pattern; and
b) etching a via hole in the sealing layer, the first hard mask, and first insulative layer based on the via hole pattern.

81. The method of Claim 79 further comprising the steps of:
forming a conductive plug in the via hole;
depositing a second conductive layer over the sealing layer; and
 patterning the second conductive layer.

82. The method of Claim 79 further comprising the steps of:
simultaneously forming a conductive plug in the via hole and depositing a second conductive layer over the sealing layer; and
 patterning the second conductive layer.

83. The method of Claim 77 further comprising the steps of:
depositing a second insulative layer over the sealing layer; and
 forming a via hole through the second insulative layer, the sealing layer, the first hard mask, and the first insulative layer.

~~84.~~ The method of Claim 83 further comprising the steps of:
forming a conductive plug in the via hole;
depositing a second conductive layer over the sealing layer; and
 patterning the second conductive layer.

~~85.~~ The method of Claim 83 further comprising the steps of:
simultaneously forming a conductive plug in the via hole and depositing a second
conductive layer over the sealing layer; and
 patterning the second conductive layer.

(Cancelled)
~~86.~~ The method of Claim 77 further comprising the steps of:
depositing a second insulative layer over the sealing layer;
depositing a second hard mask over the second insulative layer; and
forming a via hole through the second hard mask, the second insulative layer, the sealing
layer, the first hard mask, and the first insulative layer.

~~87.~~ The method of Claim 86 further comprising the steps of:
forming a conductive plug in the via hole;
depositing a second conductive layer over the sealing layer; and
 patterning the second conductive layer.

~~88.~~ The method of Claim 86 further comprising the steps of:
simultaneously forming a conductive plug in the via hole and depositing a second
conductive layer over the sealing layer; and
 patterning the second conductive layer.

89. A method of manufacturing an interconnect comprising:

- a) providing a first patterned layer of conductive material, the first patterned layer having trenches;
- b) depositing a first insulating material over the first patterned layer to fill the trenches of said first patterned layer;
- c) etching at least two air gaps in the first insulative material; and
- d) depositing a sealing layer over the first insulative layer and the air gap to seal the air gap.

90. The method of manufacturing an interconnect of claim 89 wherein each trench has an X dimension and a Y dimension and wherein said step of etching air gaps in the first insulative material further includes the steps of:

- a) etching a first air gap and a second air gap in the X dimension of the trench filled with the first insulative material; and
- b) leaving a support pillar between the first air gap and the second air gap.

91. The method of manufacturing an interconnect of claim 89 wherein each trench has an X dimension and a Y dimension and wherein said step of etching air gaps in the first insulative material further includes the steps of:

- a) etching a first air gap and a second air gap in the X dimension of the trench filled with the first insulative material; and
- b) leaving a support pillar between the first air gap and the second air gap.

92. The method of manufacturing an interconnect of claim 89 wherein the first patterned layer includes an interconnect line, said interconnect line having a top surface and wherein said step of etching air gaps in the first insulative material further includes the step of:

- a) etching a first air gap on the top that extends to the top surface of the interconnect line.